REMARKS

Claims 1, 4, 42, 43, and 45-56 are pending. Claims 1, 4, 42, 43, and 45-56 are rejected under 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 102. Applicants address each basis for rejection as follows.

Summary of the Invention

The invention includes an isolated glycoprotein containing the human amino acid primary structure of CD55 and a tumor-specific N-linked glycostructure having an apparent molecular weight of about 82 kD in sodium dodecyl sulfate ("SDS") polyacrylamide gel electrophoresis. The glycoprotein is present on adenocarcinoma cell line 23132, but not on a normal cell. In addition, the invention includes sections of a glycosylated human CD55 protein expressed by adenocarcinoma cell line 23132, but not by a normal cell having a portion of the sequence of the glycosylated human CD55 protein of about 82 kD and having a tumor-specific N-linked glycostructure. The glycoproteins of the invention are useful for eliciting antibodies capable of inducing cell death in a variety of tumors.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 1, 4, 42, 43, and 45-56 stand rejected under 35 U.S.C. § 112, first paragraph, for an asserted lack of written description in the specification. The Office

states (page 3):

> Applicants' specification does not provide relevant identifying characteristics and details on the tumor-specific N-linked glycostructure listed in the claims. It remains unclear what the structure is of the tumor-specific N-linked glycostructure. Location of the single N-linked glycosylation site on CD55 is not the same as knowing the structure.
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> In view of Applicants not being able to define, nor characterize the glycostructure, one of ordinary skill in the art is not clear on the variability that possibly exists within the genus of glycoproteins.

Applicants respectfully traverse this basis for rejection.

Contrary to the Office's contention, the specification as filed meets the written description requirement of 35 U.S.C. § 112, first paragraph, for the tumor-specific N-linked glycostructure recited in the present claims. Claims 1 and 50 limit the "genus of glycoproteins" to CD55 proteins that (1) contain a tumor-specific N-linked glycostructure, (2) have an apparent molecular weight of about 82 kD in sodium dodecyl sulfate polyacrylamide gel electrophoresis, and (3) are present on adenocarcinoma cell line 23132, but not on a normal cell. Hence, the glycoprotein must be present on the 23132 cell line.

As noted in Applicants' last reply, the specification describes the 23132 cell line as being deposited in a public depository (the DSMZ) under accession number DSM ACC 201. For example, at page 5, lines 12-18, of the English language text, the specification states:

> In SDS-polyacrylamide-gel electrophoresis ... such a glycoprotein that can be obtained from, for example, human adenocarcinoma cell line 23132 (DSM ACC 201) ... has an apparent molecular weight of about 82 kD.

Applicants, in previous replies noted that, in *Enzo Biochem*, the Federal Circuit has held that one may comply with the written description requirement by publicly depositing the biological material. The Court stated:

> [R]eference in the specification to a deposit in a public depository, which makes its contents accessible to the public when it is not otherwise available in written form, *constitutes an adequate description of the deposited material sufficient to comply with the written description requirement of § 112, ¶ 1.* (Emphasis added.)

Enzo Biochem, Inc., v. Gen-Probe Inc., 323 F.3d 956, 965, 63 U.S.P.Q.2d 1609, 1613 (Fed. Cir. 2002).

In *Enzo Biochem*, the deposits were recombinant bacterial cells expressing the DNA molecules of interest; the deposited cells provided adequate written description for the DNA molecules even though the sequence of the DNA molecules was not set forth in the specification. Given that Applicants' specification describes a publicly deposited cell line expressing a glycoprotein having the glycostructure encompassed by the present claims, Applicants submit that the description of the glycostructure in Applicants' specification meets the written description standard set forth by the Federal Circuit in *Enzo Biochem*. Applicants maintain that, in view of the deposit and the recitation of the deposit in the specification, *Enzo Biochem* supports Applicants' position that the glycostructure need not be characterized by chemical structure to meet the written description requirement of 35 U.S.C. § 112, first paragraph.

In response, the Office cites *Enzo Biochem* as stating that "a showing of

possession alone does not cure the lack of written description." Applicants note that the section of the *Enzo Biochem* decision preceding the statement cited by the Office reads:

> [The written description] requirement is not met if, despite a showing of possession, the specification does not adequately describe the claimed invention. After all, as indicated above, one can show possession of an invention by means of an affidavit or declaration during prosecution, as one does in an inference or when one files an affidavit under 37 C.F.R. § 1.131 to antedate a reference. However, such a showing of possession alone does not cure the lack of written description in the specification, as required by statute.

Enzo Biochem 323 F.3d at 969, 63 U.S.P.Q.2d at 1617.

The Court in *Enzo Biochem* goes on to state:

> For biological inventions, for which providing a description in written form is not practicable, *one may nevertheless comply with the written description requirement by publicly depositing the biological material*, as we have held today. *That compliance is grounded on the fact of the deposit and the accession number in the specification, not because a reduction to practice has occurred.* Such description is the quid pro quo of the patent system; the public must receive meaningful disclosure in exchange for being excluded from practicing the invention for a limited period of time. (Emphasis added.)

Enzo Biochem 323 F.3d at 970, 63 U.S.P.Q.2d at 1617.

Applicants' specification, like the specification in *Enzo Biochem* and as noted above, provides an accession number for a public deposit of the cell line which expresses a glycoprotein having the glycostructure encompassed by the present claims. Hence, the facts of the present case fall squarely within the facts of *Enzo Biochem*. The biological material, cell line 23132, has been publicly deposited and the specification provides the accession number of the deposit.

In addition, as noted in Applicants' previous replies, antibodies that recognize the amino acid primary structure of CD55 (DAF) were also available in the art at the time the present application was filed (see, e.g., Hara et al., Immunol. Lett. 37:145-152, 1993; copy enclosed with Applicants' August 30, 2004 reply). In fact, Karnauchow et al. (Journal of Virology 70:5143-5152, 1996) cited by the Office in the April 11, 2006 Office Action describes an antibody that binds wild-type CD55 (DAF). These publicly available antibodies allow one skilled in the art to identify and isolate the 82 kD CD55 glycoprotein expressed by the 23132 cell line.

For all the above reasons, there can be no question that Applicants' specification adequately describes the glycostructure recited in the present claims. The 35 U.S.C. § 112, first paragraph rejection should be withdrawn.

Rejection under 35 U.S.C. § 102

Claims 1, 4, 42, 43, and 45-56 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Vollmers et al. (Cancer 76:550-558, 1995; "Vollmers") as evidenced by Hensel et al. (Cancer Research 59:5299-5306, 1999; "Hensel"). Applicants respectfully traverse this basis for rejection.

The Office states (page 4):

> Vollmers discloses the same tumor cell line, 23132 (stomach carcinoma) as Applicants ... This cell line inherently has a glycoprotein comprising the human amino acid primary structure of CD55 and a tumor-specific N-linked glycostructure and exhibits and possesses the same properties as claimed ... Hensel is extrinsic evidence that shows the 23132 cell extract of Vollmers is

the same as Hensel's and inherently contains the same glycoprotein of about 82kDa.

In response, Applicants note that claims 1 and 50 recite an *isolated* glycoprotein. In particular, the isolated glycoprotein of claim 1 is required to have an apparent molecular weight of 82 kD in SDS polyacrylamide gel electrophoresis. Claim 50 is directed to isolated glycoprotein that contains a section of a glycosylated human CD55 protein expressed by adenocarcinoma cell line 23132, but not by a normal cell and where the glycosylated human CD55 protein has an apparent molecular weight of about 82 kD in SDS polyacrylamide gel electrophoresis. Vollmers fails to describe an isolated glycoprotein of about 82 kD.

Contrary to the Office's assertion, the *whole cell extract* described in Vollmers is *not* the same as the *membrane preparation* of Hensel. Hensel describes additional purification steps that must be taken to isolate the 82 kD protein. On this point, Applicants direct the Office's attention to the enclosed Declaration by Dr. Frank Hensel. Dr. Hensel is an author of the Hensel reference and is familiar with the disclosure of Vollmers. The Hensel Declaration states (paragraph 3):

> Vollmers et al. does not describe an isolated glycoprotein including the human amino acid primary structure of CD55 and a tumor-specific N-linked glycostructure, where the glycoprotein has an apparent molecular weight of about 82 kD in sodium dodecyl sulfate polyacrylamide gel electrophoresis. Hensel et al., at page 5301, cites Vollmers et al. as describing a 50 kD protein in whole cell lysates bound by the SC-1 antibody. In Hensel et al., to detect the 82 kD protein, the stringency had to be altered and membrane preparations, not whole cell lysates, had to be used. The 82 kD protein was isolated from membrane fractions and purified by sequential size-exclusion and anion-exchange chromatography. These additional steps required to

purify the 82 kD protein are not described in Vollmers et al.

Similarly, Applicants' specification teaches, under "Results" at page 28 of the English language specification:

> In Western-blot analysis of extracts from total cell lysates of gastric carcinoma cell line 23132 ... antibody SC-1 reacted with a protein with a relative molecular mass of about 50 kD. By altering the stringency (1M of NaCl) and *with the use of membrane preparations*, it was possible to detect other proteins with approximately 70 kD and approximately 82 kD ... These proteins were *isolated from the membrane fractions* and purified by sequential size-exclusion and anion-exchange chromatography. (Emphasis added.)

As described in the above section of the specification, Applicants, like Hensel, did not detect the 82 kD glycoprotein in the whole cell lysate, but rather had to use membrane fractions to isolate the 82 kD protein. Consequently, contrary to the Office's position, Hensel shows that the whole cell lysate extract in Vollmers is insufficient to isolate the 82 kD glycoprotein. For all the above reasons, Applicants submit that Vollmers fails to describe an isolated glycoprotein of 82 kD. The 35 U.S.C. § 102 rejection should be withdrawn.

CONCLUSION

Applicants submit that the application is now in condition for allowance, and this action is hereby respectfully requested.

Enclosed is a Petition to extend the period for replying to the final Office Action for one (1) month, to and including November 25, 2007, and a check in payment of the required extension fee.

If there are any additional charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

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